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The Public Health Journal

Vol. X

JANUARY, 1920

No. 13

The Preparation of Smallpox Vaccine

BY J. G. FITZGERALD, M.B.,

Professor of Hygiene, and Director, Connaught Antitoxin Laboratories, University of Toronto.

THE present method of obtaining vaccine virus or smallpox vaccine, as it is more commonly called, is possibly not entirely familiar to all those who are at times required to use it. The following description of the method may serve therefore to answer certain questions which may have arisen.

First of all, the virus is obtained from young, vigorous calves. These calves are as a rule a few weeks old. They are, when received at the Connaught Laboratories at the University farm, kept under observation for one week and carefully examined to make sure they are healthy. During the time they are in use, they are fed only on milk, and sterile sawdust is used for bedding purposes.

Immediately after the period of observation, the animals' hair is removed with clippers, and the calf is put in a porcelain bathtub and given a thorough scrubbing. This completed, the animal is now installed in a model sanitary room in which there are terrazzo floors, and tiled walls, and which is properly lighted, heated and ventilated.

The suite of rooms used for the purpose of housing the calves, vaccinating them, etc., consists of a preparation room, operation room and calf room. All have terrazzo floors, tiled walls and every convenience found in a modern hospital operating room. The plant was designed by and built under the direction of one of the best known firms of hospital architects on the continent.

Having then a perfectly healthy calf, kept under ideal sanitary conditions, the third factor necessary is a supply of so-called "seed-

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virus." This is the vaccine virus which is used in the propagation of the virus from calf to calf. The seed-virus used in the Connaught Laboratories is obtained from the Research Laboratories of the Department of Health of the city of New York. The director of these Laboratories is Dr. W. H. Park, one of the leading bacteriologists and hygienists in America. This seed virus is produced under the license of the Treasury Department of the United States, and the production is supervised by officers of the United States Public Health Service.

This seed virus then is produced under the most ideal conditions. It may here be stated that calves are not susceptible to nor can they convey the causative germs of syphilis or leprosy as is sometimes maintained by those who are opposed to vaccination.

The calf before it is vaccinated with the seed-virus is again carefully washed, and the area to be vaccinated is shaved and cleansed, and just before the vaccination is done this area is covered with sterile towels. The vaccination of the calf consists in making a series of very light scratches and distributing the seed-virus over the area so prepared. In this operation, which is done under strict aseptic conditions, the same care is taken as that which is exercised by any surgeon in a modern hospital.

When the vaccination of the calf has been completed the animal is again put in the calf-room, fed with milk, carefully attended, and kept scrupulously clean. The temperature of the calf is taken twice daily. On the fifth or six day after vaccination the typical vaccine vesicles appear and the vaccine virus is then removed. The calf is chloroformed, and after death the vaccinated area is carefully cleansed and the pulp, consisting of the vesicles, vesicular fluid, etc., is removed.

A complete post-mortem examination is now made. Each of the internal organs is examined carefully and thoroughly, and if either the organs or the body of the calf shows any evidence of any diseased condition the vaccine is of course discarded. This examination is comparable to the inspection of meat intended for human consumption which is made at the abattoirs.

The vaccine pulp is now sent to the University Laboratories for final preparation. The pulp is carefully ground with a mixture of sterile glycerine and carbolic acid. After grinding, the mixture is forced through a very fine bronze wire gauze. The resultant emulsion closely resembles cream when the grinding has been completed.

The mixture of glycerine and carbolic acid very rapidly kills the bacteria which are present in the pulp, and in the course of several weeks (and before the vaccine is sent out) the vaccine is practically free of all bacteria. Elaborate tests are then made to determine whether any pathogenic germs remain in the virus.

Bacteriological cultures, aerobic and anaerobic, are made and laboratory animals are injected with the vaccine and with fluid culture material. As soon as it has been definitely determined that there are no pathogenic bacteria in the virus, its potency or power to give satisfactory "takes" is ascertained by vaccinating rabbits with samples from each lot of virus. After these careful tests on rabbits and when typical "takes" have been produced, and all other tests are completed the vaccine virus is ready for distribution. It is carefully filled into sterile capillary tubes, each capillary tube containing sufficient vaccine for one person, or it is put into sterile glass vials sufficient in amount for fifty vaccinations.

It should be remembered that while many tubes of vaccine virus contain no bacteria whatever, and no virus ever contains pathogenic bacteria the presence of which can be determined by animal inoculations, still the most rigid requirements, such as those of the United States Government (which exercises supervision over vaccine virus production) does not require that the virus be bacteria free. It is required, that it have very few bacteria, that none of these be pathogenic and that the virus itself give satisfactory "takes." The vaccine virus prepared and distributed by the Connaught Antitoxin Laboratories of the University of Toronto, more than meets these requirements of the United States Government.

Considerable notoriety is sometimes given, through paid advertising inserted by those opposed to vaccination, to the fact that vaccine virus may, and sometimes does, show the presence of staphylococci. When examined bacteriologically, such saprophytic staphylococci which are always present in the skin, are sometimes present in the virus; but it should be remembered that even if the virus were sterile, as indeed it often is, it is at once contaminated when placed on the arm, by the cocci in the skin of the arm of the person who is being vaccinated.

The very careful post-mortem examination of the calf renders impossible the transmission of tuberculosis, just as meat inspection renders impossible the spread of this disease when calves' meat is used as food. It can be very definitely asserted therefore that not one of the diseases mentioned is ever transmitted by the vaccine virus produced by the method here outlined. It is sometimes argued

that tetanus is caused by vaccine virus. This is impossible because the animal inoculation would at once reveal the presence of lockjaw germs, and the culture fluids would indicate the presence of its toxin, since both of these are injected into guinea pigs which are very susceptible to lockjaw.

Furthermore, in a careful examination of several million capillary tubes in the Hygienic Laboratory of the United States Public Health Service, no tube of vaccine has ever been found to contain tetanus bacilli. Where tetanus follows vaccination, it is due to infection of the vaccination wound with dirt containing tetanus germs, just as tetanus was observed amongst men in the army whose wounds were infected with highly fertilized soil containing tetanus germs.

Finally, it has recently been alleged that diphtheria and Eucephalitis lethargica (sleeping sickness) follows vaccination. There is not a vestige of sound evidence to support such statements. Both of these diseases have been observed in communities where smallpox did not exist and where vaccinations on a large scale were not being carried on. Diphtheria has been very prevalent in the city of Buffalo during the present fall, and various other American cities where smallpox has not been reported, have also had an unusually large number of cases of diphtheria recently. Many cases of Eucephalitis lethargica have been reported in Winnipeg during the past two months, but neither smallpox nor general vaccination can be offered as an explanation for its occurrence there at this time.

Therefore, it may be stated that none of the allegations of those opposed to vaccination, in regard to vaccine virus being responsible for the death or disability of those vaccinated, can be substantiated.

In conclusion, a word or two is necessary in reference to the reactions following vaccination. Vaccination when it is successful produces in those vaccinated the condition known as vaccinia or cowpox. Vaccinia is characterized by a local and general reaction, varying greatly in severity in different individuals, depending upon various factors such as degree of susceptibility, whether previously vaccinated, potency of the virus, etc.

In typical primary vaccinia the incubation period is four to five days, and immunity follows in from eight to twelve days after vaccination. If vaccination is performed on a person who is developing smallpox, and who is in the last few days of the incubation period of the disease, vaccinia and smallpox both run their course in such a person at the same time. Vaccination in the first few

days after infection, may, however, result in protection being conferred, that is the person has vaccinia, but not smallpox. After one successful vaccination or revaccination the condition of vaccinia usually has a shorter incubation period, runs a more rapid course, and frequently produces less severe local and general reactions. Persons who are naturally immune to vaccinia and to smallpox, or because of previous vaccination are immune, when vaccinated afresh have only a slight local reaction. This reaction when typical is a definite indication of immunity, perhaps not complete or permanent, but sufficient for the time being.

The only other consequence of vaccination may be a simple trauma, where a slight abrasion of the skin is noted, and no immunity reaction, accelerated reaction or ordinary primary vaccinia follows the application of the virus. This is what occurs when the vaccination is not properly performed or when the virus is inert.

The character and severity of local and general reactions following vaccination vary greatly as has been noted above, but it may be stated that in early childhood these reactions are practically always less severe than in later life. Therefore primary vaccination should be done in children preferably during the first two years of life, when reactions are less severe and where care can be taken to avoid secondary infections of vaccination wounds.

Since vaccination is the best means now available for the control of smallpox it is most desirable that all health departments and physicians initiate and continuously carry on a thorough campaign of education in regard to vaccination. In this way only can prejudices and superstitions in regard to the question of the merit of vaccination against smallpox be successfully overcome.

Some of the Successes and Some of the Failures of our Profession

With Reference to Preventable Disease.

DR. W. B. MOORE, M.H.O., KENTVILLE, N.S.

(*Association of Medical Health Officers of Nova Scotia, July 1, 1919.*)

WHILE the Association of Medical Health Officers, of which I have the honour of being President, is composed of those members of the Profession who have their duties and obligations clearly defined in the Public Health Act of the Province. I shall venture to make a few remarks with reference to possibilities beyond such limitations, and applicable to the whole Profession in its relations with the General Public, and with reference to its influence upon the State.

With reference to the part played by our profession generally towards the attainment of such a desirable objective as the combination of the sound mind with the sound body, in the largest possible percentage of the human race, possibly the traditions and modesty of our Profession would better justify an admission of our failures rather than an exploitation of our successes, but it seems only fair to ourselves and educative to the Public to enumerate some of the latter, as well as to acknowledge the former. While it must be conceded that some agencies outside of the Medical Profession have contributed to the great movement for the prevention of disease, yet there is no doubt that most of the great discoveries and the initiative of their application to the welfare of humanity in that direction, have been due to the study, observation, and researches of members of our profession, generally without fee or reward, and often the result of patient toil and experience, gained at personal risk and suffering of humble workers, who practically unknown, unheralded, unhonoured and unsung, have slaved for the welfare of humanity through the centuries from the early ages to the present time. It is a paradoxical and rather wonderful fact that of all professions and business occupations of the human race, ours has been the only one with a continued history of earnest endeavour by its members, to lessen, rather than to increase or develop the actual sources of income upon which their livelihood depends. The truth of this statement has been demonstrated so often and so constantly that it is beyond question, and yet it is so at variance with the training of those in other lines of work

and the general instincts of the Public, that it is not to be wondered at that the world neither understands nor appreciates it, and of course has little or no gratitude for it, and even worse, fails to co-operate either by effective state legislation or by individual or collective effort, to assist the profession in its constant struggle to vanquish, whenever possible, the diseases which afflict humanity, when evident, and to prevent their development, by combined and individual efforts. It is scarcely necessary to enumerate to an intelligent general audience, and much less to the members of the Profession present, some of the outstanding facts in the history of disease which demonstrate some of the successes of our Profession in the prevention or material mitigation of many of the most terrible diseases afflicting humanity. The observations of Dr. Jenner, an English country doctor, led to the practice of vaccination, with millions of lives saved, and human suffering indescribable prevented, and it seems a reasonable assumption that the milder forms of the disease in recent times may be due to the effects of vaccination upon the ancestors of those who have never themselves undergone the operation. Then consider the relative control of that terrible disease, Asiatic Cholera, by efficient sanitation, and of Yellow Fever prevention, by destruction of the breeding places of the cause. Typhoid Fever has been so controlled during the war by preventive inoculations and sanitation as to have shown little of the virulence of the past, and the relative prevention of that dread scourge, Diphtheria has been accomplished to a wonderful degree by the use of the well-known antitoxin. Then consider the effects of medical science, observation and experience upon the housing, living conditions, and the sanitary construction and ventilation of public buildings in which there is still room for improvement, although much has been done, also food inspection, public school inspection, the value of fresh air and sunlight, improved milk supplies, sewerage and pure water supplies, and methods of control of contagious and infectious diseases generally. Surely these are successes, and while their development and value have required the intelligent co-operation of the laity, yet to the Medical Profession must be ascribed the credit for their inception and efficiency.

Let me refer for a moment to the progress that has been made in our own province during the last few years along the lines of the conservation of the Public Health. Mainly through the influence and activities of our Provincial Health Officer, who is also our secretary, our Provincial Health Laws have been consolidated and brought up to date and made more efficient, measures have been instituted to grapple with the great problems of the prevention or at least the lessening of such widespread and destructive diseases as Pulmonary Tuberculosis and venereal diseases, and a system calculated to ensure Co-ordinate and Co-operative Medical

Health Officer's work throughout the province with greater professional control and influence has been inaugurated. Further this organization has been made what is reasonably hoped to be a permanent institution whereby at annual meetings and otherwise "Esprit de Corps" a strong fraternal feeling may be established, a community of interest may be developed with the general public, and matters of professional and public importance may be discussed for the education of ourselves and for the enlightenment of many of the intelligent laity with whose company we are honoured this evening, whose co-operation we need and desire, and believe we shall have to the degree of such understanding and appreciation of our objects and ideals as may come by means of such association with us, and who in turn will doubtless generally instruct those who, by reason of natural limitations or circumstances, may be less fortunate in their mental equipment than themselves. So much for some of our successes to date, not painted in excessively roseate hues, I hope, and yet fairly bright and true, justifying an optimistic belief in the possibilities of the future.

Now, with regard to the drab colours with which the picture of our failures must be painted. Technically and professionally we have failed to discover the cause or causes of cancer, and, of course, cannot apply any means of prevention. We are still hoping that continued patient research may enlighten us further with regard to this dread disease, and there is no reasonable doubt of future success in the light of past achievement in other directions. With regard to our lack of efficient means of preventing such devastating scourges as pulmonary tuberculosis and venereal diseases, our failure is not so much due to technical or professional shortcomings, as to our obvious inability to control or even to materially change for, I fear a long time to come, those complex conditions of domestic, social and industrial life, upon which their existence so largely depends. Even so, our profession must still be the main dependence of the State for intelligent assistance in the application of any really efficient measures for the material mitigation or prevention of the evils. Our similar lack of power of prevention of the lamentable increase of various degenerative diseases of the heart, arteries, kidneys and nervous system, must obviously be ascribed to the same causes and our control of them logically presupposes our control of modern life conditions to which they are due. Clearly our limitations are marked, and yet we must cultivate an optimistic spirit. It is too much to expect that we can, by purely professional agencies, remove the causes referred to, but we can, by initiative resulting from their recognition, lead to a more widely spread knowledge of their dangers, and by education, etc., we may in a measure lessen their evils. I may be pardoned for again referring to my hobby regarding the inefficiency of the profession at

large in controlling preventable diseases beyond the scope of the Medical Health Officer's duties, by reason of our antiquated system of depending on other than professional observation, experience and training in determining the necessity of and instituting preventive measures for the avoidance of disease before its occurrence. Since 1912, when I read the first paper upon the subject at a meeting of the Nova Scotia Medical Society at Lunenburg, I have inflicted upon some of you from time to time, several papers advocating a different system of relationship of the medical profession and the general public, by which the first departure from the normal could be determined by the trained eye, ear and judgment of the physician by close observation of the individual from birth until death. To-day, as we know, under our present system the patient is usually seen when the prevention of trouble has not been attempted, and too often when cure is impossible. Pardon me for repeating what I have often said before, that if the physician could have a close and frequent observation of the individual at all stages of his or her life, such a degree of diagnostic acumen and skill in determining the first existence of weakness or tendency to disease, would be developed as we have hitherto unknown, and a wonderful range of professional control of preventable diseases of many kinds would be accomplished. This, of course, is beyond the limitations of our functions as Medical Health Officers, so clearly defined in the Public Health Act, but I think we should develop a broader vision of our possibilities than merely acting as sanitary inspectors of dirty premises and quarantining houses for infectious diseases. Of course these remarks apply to the whole profession with reference to its relation to the public, but I must confess my inability to suggest any practical revolutionary change by which this can be readily accomplished. Personally, I have done a little along the lines suggested, and a few of my families who recognize the value of such a system of regular supervision expect me to visit them frequently without being sent for, and I have been able in a few instances to recognize and to avert serious dangers to the health and development of some. Public school inspection, with reference to the adoption of a system of improved observation of the individual by the physician, is clearly a long step in the right direction, but, in my opinion, cannot compare with such a relationship between physicians and families, as would not only enable them to have a constant supervision of the growth, development, tendencies and weaknesses of individuals at all periods of their existence, but in many ways might improve their home life and conditions. Dr. Fraser Harris, of Dalhousie University, is to give us a paper at this meeting referring to the question of State Medical Service, and something of that sort may be the solution of the problem of a more efficient way of dealing with preventable diseases,

by closer professional association with the people. I think I may class among our failures our regrettable and even lamentable lack of power as a body in our influence upon the state, and after centuries of toil, observation and study for the benefit of humanity to a much greater degree than for the benefit of ourselves, we must confess to a much less leverage and pull with the governments than that possessed and exercised by the average ward politician. It is doubtful even in purely medical legislation or in legislation affecting the people in matters upon which the medical profession only is able and qualified to judge that we can exercise very much leverage, or control of legislative bodies. Permit me to present a couple of marked illustrations of this fact. Instead of following the advice of the only source of authoritative opinion, that is the medical profession, and enforcing vaccination as a general compulsory measure to prevent small-pox, the politicians both in the Old Country and in this cater to the ignorant and prejudiced masses by the introduction of a conscientious objection clause, and so the thing goes on. Then witness the lack of courtesy to our profession, when no expression of opinion is requested through our various representative bodies and societies with regard to the sections relating to the medical profession in the Nova Scotia Temperance Act, where the lawful usage per diem of one of our most powerful medicinal agents is determined by a non-professional body. Drastic and insulting clauses have been passed in that Act, affecting the rights and privileges and interfering with the judgment of the practising physician in the application of remedies for the treatment of disease, and hundreds of conscientious, honourable and capable members of a profession with the history of ours, are driven to change their therapeutic practice, and dosage of a drug in any given case, and to give other medicines, or to become law breakers. For the offences of the few in the profession who may have abused their privilege, the many are penalized, and the only qualified individuals to administer powerful drugs are obliged to make their knowledge and experience subservient to the dictum of non-professional extremists. Surely one might expect at least a conference with representatives of the profession before the passage of such a despotic law, and surely the history and status of our profession should justify such an expectation. While the evils of a qualified autocracy may be evident, those of an unqualified autocracy are certainly not negligible, but on the other hand, often constitute the worst form of despotism, and we have too many instances of this in so-called Democracy. This may seem to be a digression from the text, but it is along the lines to the point I wish to make, and indicates in a marked way our failure to influence legislation in matters directly connected with our professional work. My firm opinion is that a qualified autocratic power exercised

by the medical profession with its sense of responsibility and obligations to society, upon all matters within the scope of its relations to the public, pertaining to individual and public health and the prevention of disease would confer infinitely more benefits and less evils, both to the individual and to the state, than exist under the limitations of to-day. Let us consider for a moment the ways and means whereby this failure may be corrected. Of course such organizations as this and our provincial and local societies must and do exercise some considerable influence upon the governing bodies of the state and resultant legislation, but we are still far from that proper and desirable position of dignity and power to which the profession, with all its shortcomings, is surely entitled. I am convinced that only by closer association with the people in a professional relationship as I have previously indicated whereby we will be looked upon as the safe pilots to enable them to avoid many of the dangers of diseases and suffering, and an oversight of their welfare, resulting in a feeling of dependence upon our advice, may we be able to exercise that influence upon the state which may surpass that of the clergy and even equal that of the politician. There is some evidence now that governments are awakening to the necessity of recognizing the requirements of the people, by movements towards the establishment of Departments of Public Health, both for the Old Country and for Canada, and we may hope that professional rather than political control may dominate their activities.

BRITAIN HAS MINISTRY OF HEALTH

"London, January 13—Dr. Christopher Addison, President of the Local Government Board, has been entrusted with the establishment of the British Ministry of Health. In outlining the work to be done by the new ministry, Dr. Addison said to the *Sunday Observer*:—

"It will be a few months before the Ministry of Health can be established. For many purposes affecting the service the administrative unit must be a large one. A small area cannot possibly be self-contained, in a medical sense. It cannot have resources sufficient to meet all its emergencies.

"What we seek to establish is really a medical intelligence department. It will have its laboratories with everything necessary for research and will have access to all information gathered by public medical officers. It is frequently possible to see an epidemic in the distance. We shall soon look to our Intelligence Department to give us due warning of the approach of anything of the kind and to advise us as to our counter-offensive."

Halifax, N.S., Jan. 15, 1919.

To Medical Health Officers:

A letter has just been sent out to wardens and mayors asking the co-operation of the various municipalities and towns in the enlargement of this Department as follows:

1. Appointment of an inspector of health, to be an expert in diagnosis of tuberculosis and also an epidemiologist.
2. Appointment of three full time District Medical Health Officers to co-ordinate work of various local M.H.O.'s and local Boards of Health in their respective districts, to pay especial attention to sanitation of schools, lumber camps, manufacturing establishments, etc., and to arrange for medical supervision of school children.
3. Appointment of a public health nurse for each county.
4. Establishment of a health clinic in each county, especially to deal with tuberculosis and the causes of infant mortality.

Just a few words in conclusion to those who have honoured us with their presence this evening. Of course it is difficult for the public to understand how a profession, individually and collectively, deliberately lessens the chances of obtaining more of what most people work for, by making every effort to prevent diseases upon the existence of which their income depends. I do not know that we clearly understand it ourselves, or can clearly explain such an anomaly. If you will permit me for a moment to express my personal fancy with regard to its explanation, I think that while it may be due in a measure to the fact that our pride and vanity are challenged by the menace of disease, and we hate to admit either defeat in its cure or its prevention, yet my belief is that a stronger influence exists in the development of our innate sense of chivalry, compassion and spirit of knight-errantry to help the under dog, and to attempt its expression allegorically, we desire to destroy the demon of disease who is holding suffering humanity in its cruel grasp. With such a crucial test of our true professional instincts and qualities of soul, with few exceptions, we lose sight of the sordid object, pecuniary gain, in the broader vision of higher ideals of humanitarianism and science. However it may be explained, there is, fortunately for the world, continued evidence of the existence of such a professional creed, and our presence here this evening forges another link in the long chain of evidence to prove it. We are not vain of our successes. We regret our failures, but one likes to remember that tribute paid by the lamented Robert Louis Stevenson to a profession which could not save him, a gratitude in marked contrast to the ingratitude of many who have been saved when he once wrote in effect as I remember it, "I think it would be found in the final analysis that the medical profession has at least accomplished as much good, and at least has been guilty of as few mistakes and errors of human fallibility as any other class or profession in the line of human endeavour."

A Plan for a More Effective Federal and State Health Administration.

FREDERICK L. HOFFMANN, LL.D.

Third Vice-President and Statistician the Prudential Insurance Company of America

(Continued from our last issue).

THE HYGIENIC LABORATORY AND SPECIALIZED RESEARCH

The work of the Hygienic Laboratory at the present time is subdivided into four divisions, respectively (a) pathology and bacteriology, (b) pharmacology, (c) zoology and (d) chemistry. The question may be raised whether the Laboratory should not concern itself more extensively with problems of medical entomology regardless of the fact that already much admirable work in this field is being done by the Bureau of Entomology of the Department of Agriculture.* A certain amount of duplication of effort is absolutely unavoidable. To carry on malaria research, for illustration, without the closest possible co-operation of a well-organized department of medical entomology is practically impossible. As generally understood, the main purposes of the Bureau of Entomology of the Department of Agriculture are economic, and such research work, for illustration, in connection with malaria and mosquitoes as has been carried on by the Bureau has been primarily, if not exclusively, of an economic nature, emphasizing the relation of malaria frequency to variations in crop productions, etc.†

The question may also be raised as to whether the Hygienic Laboratory should not give more consideration to autopsy records, which,

*The field of medical entomology is immense, and even more so than that of economic entomology. An excellent outline of the essential facts which require to be taken into account is the "Handbook of Medical Entomology", by Riley and Johannsen, published by the Comstock Publishing Company, Ithaca, N.Y., 1915. A more popular work on the subject is "Insects and Disease", by R. W. Doane, Assistant Professor of Entomology, Leland Stanford University, London, 1910.

†A full account of what the Department of Agriculture has done in this connection has not yet been made public. The results of the experiment and demonstration at Mound, La., are, however, sufficiently conclusive to justify the suggestion that inquiries of this nature should be conducted on a much larger scale in the future. After all, it is largely upon economic grounds that public health measures must rest if they are to be assured of continued and substantial financial support. See in this connection my "Plea and Plan for the Eradication of Malaria Throughout the Western Hemisphere", and also my additional discussion of the "Malaria Problem in Peace and War", which includes a number of references to the demonstration at Mound, La.

at the present time, if collected at all in local and State hospitals, are generally deficient in matters of important details, in that the objective findings are not clearly stated, or that the anatomical diagnosis is not concisely set forth in a manner suitable for future collective investigations. There is the utmost urgency for increasing the number of autopsies, especially in public institutions, and efforts in this direction, sustained by a Federal Health Administration, would prove unquestionably more successful than has been the case in the past.*

Attention may here be directed to the first three Annual Reports of the Medical Research Committee of the National Health Insurance of Great Britain, the work of which is carried on respectively by (1) a Department of Bacteriology, (2) of Bio-Chemistry and Pharmacology, (3) of Applied Physiology, and (4) of Statistics. The general plan of research includes such special subjects as Tuberculosis, Rickets, the Hygienic Relations of Milk, the Rheumatic Affections, the Diseases of the Nervous System, the Thyroid Secretions, Dust Inhalation and Pulmonary Diseases, Oral Sepsis, Diabetes, Anaphylaxis, Diseases of the Heart, etc. Special inquiries have been made in connection with the war into such subjects as Cerebro-Spinal Fever, Neurological Inquiries, Industrial Fatigue, and the Health of Munition Workers, Diseases of the

*It is a serious error to carry the conclusions derived from autopsies too far as regards the anatomical and pathological findings concerning the true cause of death. As observed by F. J. Smith, in the *British Medical Journal* for December, 1905, "It is absolutely essential in arriving at a correct conclusion that the clinical history should be co-ordinated with the pathological findings". There is a large field of most useful information, as yet more or less neglected on the part of those who are in complete control of all the facts. Every large hospital, at least, should have a resident pathologist and there should be strict conformity to a well-established technique from the general examination of the body to the process of dissection as such and the careful as well as thorough examination of all the regions and particular organs of the body. Frequently insufficient attention is paid to special conditions and lesions which may have a most important bearing upon medico-legal questions involved in the cause of death. One of the best works on the subject of postmortem examinations is a treatise by William S. Wadsworth, M.D., Philadelphia, 1915. Another useful work is entitled "Dissection Methods and Guides", by David Gregg Metheny, Philadelphia and London, 1914. Most useful as regards the practical value of autopsy findings and their application to problems of general medical practice is "Gleanings from the Calcutta Post-Mortem Records", by Leonard Rogers, M.D., Calcutta, reprinted from the *Indian Medical Gazette*, 1908-13. Of special value to the student of the subject are the case records, both ante-mortem and post-mortem, as used in the Weekly Clinico-Pathological Exercises at the Massachusetts General Hospital, edited for the use of practitioners by Richard C. Cabot, M.D., and Hugh Cabot, M.D. Four volumes have been published, with numerous illustrations, charts, etc., all of which are an admirable model for other institutions to follow. There are no reasons why this method should not be insisted upon by the American College of Surgeons as one of the prerequisites of efficiency in hospital management, conceived in its higher aspects as a public health function.

Soldier's Heart, etc.* Thus far ten special reports have been published, including a report on the Incidence of Phthisis in the Boot and Shoe Trade; Recovered Cases of Intestinal Diseases; the Mortalities of Birth, Infancy and Childhood, etc. Of practical value also, are the plan and scope of the scientific industrial research of the Special Committee of the Privy Council, which to date has issued three annual reports, and a Special Report on Industrial Research in America, suggestive of the urgency of a similar publication on organized research in medicine and public health.

The National Research Council of the Council of National Defense, of which Prof. Geo. E. Hale is the chairman, has an important committee on Anatomy, of which Prof. Henry H. Donaldson, is the chairman; a Committee on Anthropology, of which Prof. Wm. H. Holmes is the chairman; a Sub-Committee on Bio-Chemistry and a General Committee on Medicine and Hygiene, with Col. Victor C. Vaughan as chairman. This committee has a Sub-Committee on Psychiatry, the chairman of which is Prof. Stewart Patton. In addition thereto, however, the Council has organized a General Committee on Physiology, with Prof. Walter B. Cannon as chairman; and a Committee on Psychology, with Col. Robt. M. Yerkes as chairman. The work of this committee has been subdivided into sections on the Psychological Examination of Recruits, on Aviation, on Re-Education and Vocational Training and Vision. It should not be difficult after the war to reorganize the work of these committees and sub-committees and coordinate the work of such a permanent organization to the activities of the Hygienic Laboratory of the Federal Public Health Service.

MEDICAL PRACTICE, PHARMACY AND DENTISTRY

The section on medical practice, pharmacy and dentistry will probably be the one to which most serious objections will be raised on practical grounds. The time is bound to come, however, when this

*The publications of the Health of Munition Workers Committee of the British Government are models of scientific inquiry and concise presentation of essential facts bearing upon extremely important aspects of the labour problem. Of these, for the present purpose Reports Nos. 7 and 8, on Industrial Fatigue and Special Industrial Diseases, are of exceptional importance; but reference also requires to be made to Report No. 10, on Sickness and Injury, which includes suggestions for systematic records, etc. The general results of the inquiry as presented in twenty special reports have been summarized in a Hand-Book on the Health of Munition Workers, issued in London, 1917. In addition thereto an extended report has been issued on Industrial Efficiency and Fatigue, than which no more useful statement of facts and conclusions on the subject-matter under discussion has thus far been published. No similar inquiries corresponding in plan and scope as well as scientific thoroughness in the presentation of the facts have as yet been forthcoming for the war industries of this country.

problem will have to be met and when uniformity in medical practice and interstate rights and privileges will have to be granted to graduates of recognized institutions passing examinations in conformity to Federal requirements. How far this section would ultimately encroach upon collateral branches of medicine and surgery, such as osteopathy, chiropractic, etc., may well be left to the future. In any event, even if at the outset entirely without power to establish standard requirements of medical practice, such a section would serve the extremely useful purpose of collecting information and of assisting in the solution of interstate medical problems which are now a matter of serious concern in many sections of the country. Such a section would also be in an admirable position to best utilize the large amount of information collected by the Medical Section of the Council of National Defense and to keeping such information down to date, for possible future military or other requirements. How far this section should include the nursing profession, both public and private, may also, for the time being, be left undecided.

There is much danger of confusing the true functions of the medical profession with the services of men employed in public health activities. It is grossly misleading to assert that "the physician is the guardian of the public health". Equally mischievous is the assertion made in a recent monograph on "The Practice of Medicine as a Vocation", issued by the Federal Board for Vocational Education, that "the work of the physician is twofold: It is his duty to cure those who are sick and to keep the well from becoming sick". The physician in general practice is absolutely without responsibility for the health of those who do not consult him. There is nothing contained in the curriculum of even the best medical schools which thoroughly fits a physician for the practice of preventive medicine in an advisory capacity. The same conclusion applies to medical examiners, who are almost without exception men trained in the practice of medicine as a healing art. The successful prevention of disease, individually or collectively, requires a totally different course of training and involves a largely different set of facts and principles than the training for medicine in general or specialist practice. No system of clinical medicine, however extensive, can materially aid in the solution of the many practical questions which confront those who are concerned with the prevention of disease or with physical development and growth or with abnormalities of metabolism and nutrition. The status of the physician in general practice is sufficiently difficult and burdensome not to require the discharge of additional and frequently highly responsible functions in the administration of public health. That such services are rendered in a large measure and particularly in rural or isolated communities and frequently with

beneficial results is not an answer to the argument here advanced that preventive medicine in a separate and distinct branch of science in which strictly medical considerations whether pathological, physiological or clinical are distinctly of secondary importance.

The standards of medical education are becoming more rigid and effective. It is held, and properly so, that a medical course of less than four years yields unsatisfactory results. To require four years of exacting study in subjects which lie largely outside of the practical operations of a modern health department is to waste much valuable time and opportunity urgently required for other purposes. Arguments have been advanced that before the war the number of physicians in general and specialist practice was entirely too large and that therefore the economic status of the medical profession was far from satisfactory. Evidence, however, has been forthcoming to prove that there is gradually an increase in the income of medical graduates from first-class medical schools, or approximately from \$900 during the first year to nearly \$5,000 in the fourteenth year. If the decline in the death rate is a conclusive index of the diminishing frequency of diseases requiring more or less prolonged medical attendance, there is no doubt much truth in the assertion that the economic position of at least the general practitioner has in many cases deteriorated, for if, for illustration, in a community in which malaria and typhoid fever have been excessively common there is a practical eradication of these diseases in consequence of modern health activities, there must necessarily be a material reduction in the physician's income.

It would therefore seem of the utmost importance that the medical profession should clearly recognize the necessity of a complete change in its attitude and give more encouraging support to those who may wish to take courses in preventive medicine in the furtherance of which only a minimum amount of knowledge* concerning anatomy, physiology and pathology is required. With important modifications this conclusion also applies to the position of those who prefer to specialize in medical examinations and industrial hygiene. The field of opportunity for remunerative employment in these branches is constantly broadening, in contrast to a diminishing area of usefulness in general practice. If, for illustration, the present movement for a nation-wide campaign for medical examinations and re-examinations gains the required public support, there will arise a demand for a highly specialized type of ability which is, generally speaking, not available. The recent work on "Medical Diagnosis" by Charles Lyman Green, author of a standard work on "Medical Examinations for Insurance Purposes", clearly emphasizes

*See, for illustration, "Essentials in Medicine", by Charles P. Emerson, M.D., New York, 1911.

the gradual change in the point of view which must govern in the ultimate development of a new science of public and personal hygiene, in which the physical examination of the person and the qualified observation of at least the outward sign of disease will receive prior consideration. In such a science the essentials of physical anthropology will demand equal consideration with the fundamentals of clinical medicine.

Physical examinations require to be clearly differentiated from medical examinations. Both may be made properly by different persons or they may be made by one person thoroughly qualified to make both; but it does not necessarily follow that a physician, however familiar with physical and clinical diagnosis, is competent to pass upon the numerous questions involved in a physical examination, as has been illustrated by the experience under the First Selective Draft. The conduct of so-called "Medical Examination Campaigns" cannot be approved of unless the work is done in a thoroughly qualified manner. In the long run not much is gained but much of real value may be lost by careless methods of examination. It will never be possible within the limitations of our knowledge to enable a community to "take account of stock" physically as it has been argued is the common practice in ordinary business. The parallel drawn is both inexact and misleading. Nor will it ever be possible to give "the human machine" a "thorough overhauling", for here again the parallel of comparing the human body to a machine is inexact and misleading. There is far too much involved in examinations of this kind to permit any one to take reckless chances with the health of the individual as well as with that of the community. Even though much good may be done in one direction by the ascertainment of a certain amount of existing but unobserved disease, much harm may be done, on the other hand, by impairing public faith in the real value and proper function of medicine as a healing art.

PROBLEMS OF ANTHROPOLOGY

The section on physical anthropology should be in charge of a thoroughly qualified expert whose main function at the outset should be to collect in a systematic manner the vast amount of existing anthropometric material. Assistance should be rendered in the preparation of uniform or standard blanks and the perfection of standard tables of physical proportions, all of which are at present more or less inadequate for practical purposes. There should be active co-operation, of course, with the anthropometric investigations of the Children's Bureau and other governmental or private agencies concerned with the ascertainment of physical growth and development. The U.S. Bureau of Education in 1914 issued a Bulletin on Physical Growth and School Progress, prepared by Prof. Bird Thomas Baldwin, of Swarthmore College, in

which a first attempt is made to bring together the available material on physical growth with a due regard to age, grade and school standing as well as the required facts of the individual increment of growth in height, weight and lung capacity. There are included some extremely suggestive observations on height as affected by nationality, the relation of height to complexion, as well as the average height of American born children mathematically calculated by Dr. Franz Boas from the data of nearly 100,000 children in the public schools of representative American cities. Most of the data available, however, fail conspicuously, on account of the disregard of the underlying racial considerations, which explains in part the reasons why the Committee on Race in Relation to Disease (Civilian Records) of the National Research Council intends to concentrate its work in the near future upon an effort to secure more homogeneous data for more trustworthy comparative purposes. It must be self-evident that so-called *standards* derived from heterogeneous masses of statistical material cannot possibly be relied upon for a nation like the United States, where the racial distribution is perhaps more complex than in any other civilized country at the present time. The range in variation in the physical proportions of the different races is found to be much greater upon careful analysis than is apparent upon superficial consideration. Among other illustrations reference requires only to be made to the anthropological investigations of Dr. Ales Hrdlicka on 1,000 white and coloured children, inmates of the New York Juvenile Asylum, which include observations on abnormalities of the head, the hair, the forehead, the face, the ears, the gums, the dentition, the palate, the uvula, the limbs, and the body in general.

A much larger amount of material is, however, required, but unfortunately the underlying racial considerations are generally disregarded in ordinary routine examinations of children for school purposes. Data for Chicago school children or Boston school children cannot possibly be of much intrinsic value if merely presented in the aggregate and not with a due regard to race or parentage. Improved methods of physical measurements have been suggested by Miss Helen Thompson Woolley, the Director of the Vocational Bureau of Cincinnati, Ohio, in a contribution to the *Journal of Educational Psychology*, November, 1915. There is, however, as much danger of over-emphasizing the necessity for numerous and minute measurements as of underrating the need for thoroughness and accuracy in the more simple measurements of height, weight and lung capacity. In appreciation of the practical difficulties which are met with in all investigations of this kind, but particularly when applied to adults employed in industry, and which have been clearly recognized by the Committee on Race in Relation to Disease (Civilian Records), of the National Research Council, the standard card

recommended by this committee includes the following requirements: (a) weight, both nude and clothed; (b) height, standing and sitting; (c) arm span; (d) chest, at full inspiration and at full expiration; (e) girth, at navel; (f) lung capacity; (g) foot length; (h) flat feet; (i) hand grip; (j) missing parts; also eye colour, hair colour and chest pilosity. The medical examination includes the pulse (standing), vaccination scars, hearing, vision and the colour sense. In addition thereto a statement is required regarding the muscular development and the condition of the teeth (Appendix A).

The ascertainment of physical facts of growth and development is a fundamental prerequisite of rational public health administration. Thus far the U.S. Public Health Service has only concerned itself with this question in a very restricted field. In 1915 a brief publication was issued on the "Heights and Weights of Children" according to age and sex, with medical observations having reference particularly to cases of intestinal diseases. The name of the locality was, however, omitted. The value of the data, for the reason stated, is therefore materially reduced, since much, of course, depends upon the location and the character of the population as to racial antecedents. In 1916 Dr. Lee K. Frankel and Dr. L. I. Dublin published jointly a study of the measurements of boys and girls 14 to 16 years of age who were granted employment certificates in the City of New York. This publication is an important contribution to the subject, and more so in view of the fact that the elements of race and nativity were taken into account. It is to be hoped that the much larger amount of material which is now available will some time in the near future be utilized for the purpose of a more extended investigation. The increasing practical importance of the subject therefore demands its more qualified consideration by Federal and State health departments as well as by other health promoting organizations. The required progress towards standardization and unification is, however, not likely to be attained within a measurable period of time unless more substantial encouragement is forthcoming from both the government and private agencies. Whatever in the future is done in this most promising field of scientific research having to do with the growth and development of the forthcoming generation should as far as practicable be coordinated to the research efforts of the Committee on Race in Relation to Disease (Civilian Records) of the National Research Council.*

*An encouraging proof of progress is the recently commenced issue of a *Journal of Physical Anthropology*, of which Prof. Ales Hrdlicka, of the Smithsonian Institute, is the editor.

INDUSTRIAL HYGIENE

The section on industrial hygiene, of the U.S. Public Health Service, has heretofore concerned itself chiefly with limited inquiries into highly specialized phases of the occupational disease problem in co-operation with the Bureau of Mines, the Bureau of Labour Statistics, etc. In view of the fact that the recently established section on Working Conditions Service of the Department of Labour contemplates a thoroughly well-developed division of industrial hygiene, in charge of a former specialist of the U.S. Bureau of the Public Health Service, the future functions of a reorganized Federal health service in this field will probably be still more circumscribed. That, however, may be a material advantage, in that the scientific research work to be undertaken or the co-operation required in highly specialized fields of inquiry will be concentrated upon the more subtle and difficult problems, rarely permitting of being adequately dealt with under a broader and more immediately practical division of work.

The Division of Industrial Hygiene of the Working Conditions Service is at present being organized upon the following plan of procedure:

1. To make studies of working conditions in their relation to health to determine hazardous processes and methods.
2. To formulate sanitary codes and regulations to meet health-hazards in the various industries.
3. To formulate standards of medical practice in industries and to co-operate in the betterment of medical service in industry and industrial centres.
4. To determine standards of physiological requirements for various occupations.
5. To determine methods of proper placement of workers.
6. To secure statistical data of industrial morbidity.
7. To promote facilities for the education and training of physicians and sanitarians for industries.
8. To assist industries in obtaining physicians and other technicians for industrial service.
9. To disseminate information concerning measures necessary to safeguard workers against industrial health hazards and to secure the co-operation of all elements, governmental or private, in the furtherance of the industrial health programme.

(To be continued.)

Social Background

The Prostitute as a Health and Social Problem

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YOU will agree with me that this is a tremendous subject, and in a paper such as this one can only speak briefly of some of its important aspects. The prostitute and prostitution have long been recognized as social and moral evils. All through the ages we find protests and sporadic crusades against them, but the efforts usually resulted in failure to eradicate the evil, and the failure is largely due to the fact that the remedies applied were inadequate and superficial. Take, for instance, the idea of driving the prostitute from pillar to post, punishing her by imprisonment and fine. Even in our own day, when we began to realize that she spreads disease and devised the newer methods, such as registration, segregation, and examination, the situation did not change much. This is all because we refused to face the facts honestly and frankly, and not only the facts but the underlying causes of this most complex phenomenon, prostitution.

Our difficulties have no doubt been largely due to the fact that prostitution is very closely interwoven with the subject of sex. The sex relation in the human, largely because of the problem of progeny, has never been faced openly, nor considered on its merits. It has always been hedged around with religious and moral doctrines, and consequently very little has been added to our store of knowledge.

As far as we know there has always been current a deep-seated belief that men at a certain age must satisfy the instinct of sex, regardless of conditions, for the sake of good health. This opinion has been fostered by some of our most eminent and high-minded physicians. It has been shared by scientists and philosophers, written about in novels, until most men and women came to think that this indulgence is not only essential to physical welfare, but to proper mental and moral development. Such a man as Professor Lecky held in his "History of European Morals" that there is no hope and no cure for prostitution.

A NEW EPOCH.

There is where we practically stood when we were shaken out of our deep slumber by the medical facts as to the great danger of the venereal diseases that result from prostitution. This subject had been discussed for many years, before congresses of physicians, but not until 1905, when the International Congress met at Brussels, was an actual change in sentiment registered. It came to us in the shape of a resolution that sexual continence is consistent with health. This was the beginning of the new era and formed the new basis for a more scientific and intelligent attack on the main underlying cause of prostitution. In this campaign the position taken was that the old idea is wrong; that sex indulgence is not essential to good health, and that venereal disease resulting from prostitution was a great menace to the individual, community and nation.

DANGERS OF VENEREAL DISEASES.

We know to-day that gonorrhoea is not as simple a disease as a cold; that it is a germ disease; that it is one of the most prevalent diseases, next to measles; that it not only affects the local genital organs, but that there is such a thing as gonorrhoeal rheumatism and gonorrhoeal heart disease; that the young man who contracts this disease even in the mildest form, unless he is completely cured, may bring the infection to his wife, even after the lapse of many years; that gonorrhoea in women is a much more dangerous disease than in men; that half of the operations performed on the former for the removal of the tubes, ovaries and uterus, are due to this disease; that it is responsible for 80 per cent. of blindness in the newly born; that it causes sterility in men and in women; that there are thousands and thousands of women who are chronic invalids as a result of the effects of gonorrhoea; and that it greatly decreases the efficiency of the individual.

Syphilis, again, we know, is due to a definite germ, is a blood disease, and highly contagious. It affects from eight to ten per cent. of the population. It is one of the most destructive diseases. It affects every part of the body as well as the mind. It is transmitted from husband to wife and then to offspring. It is responsible for the birth of diseased children, 80 per cent. of whom die. It is the cause of one-fourth of all insanity. It is one of the most frequent causes of feeble-mindedness. It greatly decreases one's efficiency and earning capacity. And we know that prostitution is the main carrier of both gonorrhoea and syphilis.

A campaign of education along these lines has been carried on in the United States for the last fourteen years in spite of ridicule and opposition, and not without considerable success. Indeed, hundreds of thousands of men, women, and young men during their adolescent period, in all classes, had been taught the new ideas and the single standard of morals. In addition new methods have been devised to deal with commercialized vice, and gradually an entire social hygiene programme has been developed which deals with practically every aspect of prostitution and its causes.

THE COURAGEOUS WAR PROGRAMME.

When we entered the late great war and came to realize that venereal disease was one of the greatest menaces that confronted European armies, the men at the head of our government appreciated very readily that something more fundamental than was being done abroad would have to be done by us if our boys were to be protected from this menace and kept fit. We are thankful that those men had the vision and courage to accept a radical social hygiene programme that was presented to them by some of the leaders of that movement. Under this programme between three and four million boys in our army and navy were taught for the first time that sexual continence is consistent with health, and the very best preventive of venereal disease. They were taught in detail the dangers of these diseases and the truth that prostitution is the main source of these infections. In spite of the fact that most people still believe that segregated districts are absolutely necessary, especially in war time, and that they could not possibly be abolished anyway, it was decided by those in charge of the social hygiene work that those agencies of vice must go if we were to make it easier for the boys to live up to the new standards of morals and to protect them from disease. To the surprise of the old vice lords, new law enforcement agencies were created which succeeded in closing eighty segregated districts in and near cantonments. This required wonderful skill and tact, for it was necessary to enlist the co-operation of the citizens of the respective communities, and in most cases the co-operation was extended.

Nobody doubts now that the campaign of education, with the closing up of the segregated districts and saloons, and the furnishing of all kinds of sports and recreation, helped enormously to keep up the morale and to decrease the venereal disease rate among our boys. Outside of the camp factors which contributed most to keep

the boys clean are the following: Responsibility aroused in our communities to furnish proper recreation and home protection to soldiers and sailors; the realization of the fact that the call of patriotism had stirred us emotionally and keyed us up nervously, and that the lure of the uniform was great, and consequently to keep all that in check a campaign of education and protection was necessary among young girls and women. It was made clear to thousands of young women what the government social hygiene programme was, what the boys were taught, and that the government expected them to help carry out that programme by being friends and comrades of the boys and inspiring them with the highest conception of womanhood.

While our own venereal disease rate at the beginning of the war shocked most of our draft boards, and even surprised the doctors, and while we treated during the first year of the war 170,000 cases of venereal disease, the venereal rate as the boys settled in the camps began to fall, until at the end of the war, it is stated on good authority, our venereal rate was lower than in any other army and navy in the world.

TASK NOT FINISHED.

Now that we have learned definitely what can be done with these diseases, and how vice is to be handled, it would be a crime not to continue the fight to the finish. We can easily adapt this war programme to civilian life. The government is ready to aid us in this campaign, and we hope that all the existing agencies will combine and work as hard as they worked during the war to wipe out the plague.

THE PROSTITUTE AS A SOCIAL PROBLEM.

Our attitude toward the subject of prostitution has changed greatly in the last few years. Thanks to Dr. Flexner's book "Prostitution in Europe" and numerous reports on vice in our own country, we have learned to speak on the subject more intelligently and humanely. When we now discuss the prostitute, the questions we ask ourselves are: who is she? where does she come from? and why is she there? Regarding the first question, various studies have been made at the morals courts, prisons, and other places where prostitutes are gathered and detained. All these studies point definitely to the same facts. Between thirty and fifty per cent. of all these unfortunates are mentally subnormal or disord-

ered. Most of these girls are physically attractive and sexually rather over-developed. Their mental state fits them only for menial or tiresome work at a very low wage. Yet like the rest of us, they long for comforts, finery, and male companionship and amusement. Not being able to satisfy these desires, they become easily discontented with their lot and are ready to fall as prey to vicious men who are always at hand. Seduction usually follows and the downward road begins.

This is the story of many of this type. We have here a definite social problem. These girls are not what they are because they are essentially immoral. They are generally victims of conditions that make them what they are, and it is our task to protect society from them and to protect them against themselves. By doing that we shall remove half of the prostitutes from the market. This can only be done, as we know, by establishing training schools in connection with farms to which these girls could be sent for permanent care and taught to do work which will make them self-supporting. We must go further. We must diagnose these cases early, before they do mischief and spread disease. In our public schools we ought to have qualified people to watch and study the children. Under present conditions the subnormal child is usually a nuisance to the teacher because he does not keep pace with the other children. He is usually made fun of by the rest of the pupils. He is pushed out of school early into the unsupervised home, and from there into the street to fall into delinquency and vice. The subnormal child, if given special training suited to his intelligence, can become a useful and self-supporting individual.

IGNORANCE AS A CAUSE.

The other fifty per cent. that go to make up the supply of prostitutes are not so easy to diagnose or eliminate. We can only hope to do it when our society changes more fundamentally, and every child has a chance to be well born of parents physically, mentally and morally sound, is provided with a good education and special training for some particular kind of work which shall yield just remuneration. However, while we are dreaming of this millennium, there are things that we can do. There are very definite facts that we have learned about this group from cases who come into our clinics for treatment or for detention. There is a large number of girls who, because of lack of home care and protection, and because of complete ignorance as to the sex organs and instincts, have not the slightest idea as to why certain liberties with

their persons are not to be permitted, and are enticed early by boys of the neighborhood and seduced. After one sex experience it becomes harder for them to resist temptation. It is a well known fact that a great number of prostitutes come from that class of juvenile offenders.

THE ECONOMICAL FACTOR.

Then comes the girl who has not been trained for any special work, who left school early for one reason or another, who is working hard getting a wage that is far too low for the modern standards of living, and is living at home or in a boarding house with very few comforts. If she lives at home, there may be a large family of children, a grouchy or drinking father, a shiftless or worn-out mother. There is not much joy or fun in remaining at home in the evenings or on Sunday. She craves for a male companion who could take her to places to which she could not go alone, like cabarets, dances, excursions—who could take her into the country and with whom she could stay out late at night.

Here again is the natural craving for excitement. It is always easy to pick up boys. They are always at hand and ready. The first one the girl meets is good enough no matter who introduced him to her and how little she knows about him. She asks no questions provided he furnishes her with what she has been longing for. They go along for a while having a good deal of fun in perfect innocence. Then the time comes, when under the influence of a little drink or after dancing until late into the night, or resting in some isolated spot in the country, he declares his love to her, telling her that he fully expects to marry her soon, that nothing much will happen anyway if she yields, and that hundreds of others are doing the same. She, under this strong urge, without knowledge as to the real dangers, consents. Then comes desertion, disappointment, pregnancy, and frequently disease. It is hard under these conditions to go back to a dull life. There is nobody to comfort her and get her out of trouble except persons of the underworld. These are always there to promise to have a miscarriage induced, after which, they say, the girl can go on earning more money and enjoy greater luxury and excitement. Downward she goes to add to the whole unfortunate group.

Then comes a group of widows, with or without children, who are left without means of support and no qualifications to earn a living wage. Of these a certain percentage drift gradually into a life of prostitution.

WHAT MUST BE DONE?

Here again the lesson we have learned from the war must not be forgotten. We now know definitely that a clear scientific and frank discussion of the sex organs and instinct, and of the reasons against promiscuous indulgence, has helped thousands of girls to a better understanding of themselves, to better self-control, and decent conduct. It has helped them to realize their responsibility to men, to understand that they must not overstimulate his already powerful urge of sex; and that comradeship and friendship must take the place of playing with sex. We also know much better what kind of protection girls and boys need, and how to furnish it. We know better than ever before that the spirit of youth craves fun and recreation, and that unless we provide these, youth will indulge in anything and everything it can find.

These are now among our social problems. Each community must realize its responsibility. For its own sake it must see that all young people are provided with more decent home conditions; with more intelligent understanding of sex; with a living wage; with the right kind of amusement and recreation.

Poverty as a Factor in Disease

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TWO years ago at Pittsburgh it was my privilege to speak to this Conference at the splendid and inspiring moment when our nation was gathering its forces for a decisive entrance into the great war. That war has now ended in complete victory for the alliance which stood for political democracy and political freedom and political good faith; yet the world is not at peace. The northern half of Asia and more than the eastern half of Europe are in chaos. In Ireland, in Korea, in Canada, there are menacing murmurings of unrest. The war for political righteousness between the nations threatens to give place to a war for social readjustment within the nations—a war almost as bitter as the first and far more complex and more difficult to comprehend. The evil forces in this war do not all march under one flag. There are possibilities of black reaction as well as of red terror. Each nation must find for itself the right path between the two extremes.

To change one familiar metaphor for another, may we not say that each of the nations is to-day like a ship in a growing storm. In a sense your ship and mine is the flagship of the squadron; for of all the nations upon earth America is the strongest in material resources and in national unity.

We cannot stay where we are. We cannot turn back to port for it is away from the anchorages of the past that the gale blows strongest. If *we* could perhaps take refuge for a time in reaction it is certain that the weaker ships of state could never follow us. We must not dash upon the rocks and founder as Russia is foundering to-day. We must find the way through to a new and better harbor on the eternal voyage—for ourselves and as an example to the other nations of the earth.

There are some things we have learned from our war experience that will help us to formulate the sailing directions for this voyage. The clearest of these lessons perhaps is the lesson that the strength of a nation in war and in peace depends upon its spiritual unity, upon what in military terms is called morale; and morale has both a material and a spiritual basis. The British in the terrible retreat from Mons, the French in the dark days of Verdun, were upheld by a spiritual force so splendid and so supreme that it wrung victory from what seemed to be overwhelming defeat. In peace time we cannot count on such devotion. We must base our national morale in the daily tasks of life upon a certain *quid pro quo*. In the long run men will love their country because she is worth loving; and the nation which makes the life of the largest proportion of its citizens safe and sound and happy is the nation which will in the end triumph over internal dissension as well as foreign foes.

HEALTH AS A NATIONAL IDEAL.

There are many things that must be ensured to the men and the women and the children of the nation if America is to endure, and to lead other people into the harbor of the future. There must be physical health. There must be the opportunity for normal family life with a modicum of material comfort. There must be education and intellectual stimulus. There must be opportunity for the instinct of craftsmanship—the urge of creation—and for the instinct of play—the call for relaxation. There must be the inspiration of a compelling common ideal.

To-night we ask you to consider with us just one of these essentials for national unity—that of physical health. It is, perhaps, the

least of them in the sense that we would all exchange a considerable degree of health for any one of the higher gratifications. Yet these ideals should not be mutually exclusive, but the reverse; and to the extent that abounding health underlies normal family life and intellectual and productive and spiritual satisfaction it is the most fundamental and important of them all.

The health of the people then must be one of our ideals for the new America which is to be borne of the birth pains of the war. It must be ensured by the application of sanitary science and preventive medicine on a scale far greater than we have ever dared to dream. It must be ensured by a reorganization of medicine and nursing service on some social plan so that rich and poor may receive the gifts of medical science and may receive them at the stage when they can operate effectively and not, as to-day, when it is too late to do much more than ease the sufferer into his grave. These are problems for the health officer, for the physician and the nurse, problems in which most of the members of this Conference are interested as you are interested in the application of scientific research and scientific organization to the betterment of human life in every field. There is still another problem here, however, which concerns you even more directly—the problem to which the health sessions of this Conference have been directly and exclusively devoted—the problem of poverty as a factor in sickness.

POVERTY AND DISEASE.

More and more clearly it is becoming evident that many people are sick and many people die because they are poor—not only in starving Russia and devastated Belgium, but in America, as well. As we go deeply into any great public health problem, such as infant mortality, or tuberculosis, or mental disease, we find that after health organization and health education have done their best, there is still poverty to be reckoned with as a causative factor in disease. In the Johnstown survey Miss Duke tells us that the infant mortality in one ward was 271 deaths per 1,000 births against 134 for the city as a whole and 50 for the ward which showed the lowest rate, and the explanation is that "This is where the poorest, most lowly persons of the community live—families of men employed to do the unskilled work in the steel mills and the mines." Dr. Sydenstricker and his associates in the U. S. Public Health Service in a report on the relation between disabling sickness and family income among cotton mill operatives in South Carolina find that with a monthly income equivalent to less than \$12 per person

(on an adult male unit basis) the sick rate was 70.1 per 1,000; with an income between \$12 and \$14 it was 48.2 per 1,000; with an income between \$16 and \$20 it was 34.4; and with an income of \$20 and over it was 18.5.

We can conclude from these figures and from many similar investigations that poverty and sickness are closely correlated. We cannot conclude that the poverty is responsible for the excess of sickness, for in many instances the relation of cause and effect may be reversed. People do not usually live in the poorest quarters of a city or work at its underpaid employments by choice or by accident. In general, and on the average, we shall find in such districts and such employments a concentration of tuberculous stock, of alcoholic stock, of feeble-minded stock—poor protoplasm and a bad environment supplementing each other in a vicious circle.

No one can perhaps tell us just how far poverty in such cases is the real and effective cause of the failure to achieve and maintain a normal standard of physical health. It is clear, however, that there is a certain standard of income below which the maintenance of health is impossible; and it seems reasonably sure that a certain not inconsiderable proportion of the population of the United States has to-day a family income below that figure.

THE NEED FOR A MINIMUM STANDARD OF LIVING.

If an initially normal family cannot gain a livelihood adequate for its minimum physical needs there is evidently a problem of social readjustment which our nation must face as a fundamental of post war reconstruction; but what shall we say of the family which on account of inherent physical or mental defects is unable to reach a minimum level under a wholly fair and equitable basis of compensation? There are but two alternatives as I can see it; since the moral sense of mankind repudiates the rigorous application of the principle of unhindered natural selection. We can let the combination of defective protoplasm and crippling environment accomplish the major portion of its work and then salvage what we can from the wreck by some form of institutional relief. Or we can apply our social energy and our community funds to make good the deficiencies in the beginning. I have little doubt, and I think you have little doubt, as to which will prove in the long run the cheaper way, and I am quite certain that the preventive method will prove more conducive to high national morale.

The more immediate goals of the health worker—efficient sanitary administration, infant welfare, stations, clinics and dispensar-

ies, and even health insurance—are but palliative measures if it be true that a substantial proportion of our people are striving to live upon a family budget below the minimum essential for physical health. The health section has devoted all its sessions during the past week to this problem; and has suggested a definite attempt to secure the first information upon which constructive action may be based. We have asked for the appointment of a special Committee on the Standard of Living Essential for the Maintenance of Health. We hope that this committee will be organized with a membership of economists, statisticians, household administrators, dietitians and housing experts sufficiently eminent to command universal confidence. We hope it will be possible for the committee to bring in a report next year which will give us an approximate minimum for the family budget, adjusted so far as necessary to varying geographical and social environments and perhaps so connected with the index of price levels that it can be utilized on a sliding scale for some time in the future. We believe that with such authoritative data in hand there will be a powerful stimulus for each locality to determine what proportion of its population is actually below the limit of safety; and that when the facts are known the argument for effective remedies will be found to be unanswerable.

THE "AMERICAN PLAN" FOR DEALING WITH POVERTY AS A FACTOR IN DISEASE.

In closing, let me pass on to you a lesson I learned a short time since from a friend and fellow-townsmen whom many of you know, Dr. David Lyman. Dr. Lyman was a member of the splendid group of public health workers who have helped to translate into action our gratitude and admiration for our gallant allies in France. He was for a time in charge of the organization established by the Rockefeller Foundation and the Red Cross to demonstrate the American plan for dealing with tuberculosis; and after the obvious things had been done, after clinics and hospitals had been provided and a comprehensive health education campaign was under way, problems of this sort began to arise. Jacques was a delicate child in a tuberculous family. He needed milk and eggs for which his parents could not pay. So the American organization furnished the nourishing food, not as a charity, but as a part of national preventive medicine. "Very good," said the French physicians, "but we thought this was a plan to be carried on by ourselves after

you have gone. Where shall we find the money to do such things?" "Why," said Dr. Lyman, "it is much cheaper for you to do this than to let the child get tuberculosis and care for him afterward," and the French became interested in the "American plan."

Marie was ill. She could be cared for at home if there was a room where she could sleep alone and get fresh air. There was no such room in the poor cottage. So Dr. Lyman sent for the town architect and asked him to draw plans for an additional room to be built onto the cottage. "But, what an expense?" "Far cheaper than letting Marie's sisters come down and caring for them all in a sanitarium," was the reply. It seemed logical and the French are apt at logic. "So that's the American plan," they said. "It seems a good one."

Jean must go to a sanatorium, but how can the family live without his wages? Easily enough. The Tuberculosis Organization will pay the family what he would be earning while he is being cured. "Is this not a dangerously costly precedent?" asked the Mayor. "Far less dangerous and less costly than letting the man die and supporting the family till the children are grown up—and more humane, too."

"Fine," said the Mayor, "I see it. And that is the American plan, too. How splendid and far sighted. I must come over to America after the war and see just how you do it."

Dr. Lyman tells me he is somewhat perturbed at times to know just where he will take his French friends when they come over to see the "American plan" in full operation. But it is worth while to see visions if they inspire us to remould this world somewhat nearer to the heart's desire. We set before you as our contribution to this Conference the vision of an America in which there shall be no single family without the income which is essential for the maintenance of health.



The Provincial Board of Health of Ontario

**Cases and Deaths from Communicable Diseases reported by Local
Boards of Health for the Month of November, 1919.**

COMPARATIVE TABLE.

<i>Diseases.</i>	Nov. 1919.		Nov. 1918.	
	<i>Cases.</i>	<i>Deaths.</i>	<i>Cases.</i>	<i>Deaths.</i>
Smallpox	1128	0	6	0
Scarlet Fever	438	7	157	9
Diphtheria	621	48	167	30
Measles	412	2	68	8
Whooping Cough	127	7	60	23
Typhoid Fever	53	24	46	13
Tuberculosis	157	124	159	124
Infantile Paralysis	2	0	1	0
Cerebo-spinal Meningitis	11	8	8	5
Influenza	16	9	.....	.....
Acute Influenzal Pneumonia .....	.....	3	.....	.....
Acute Primary Pneumonia .....	.....	162	.....	.....
Relap. Fever and Dysentery .....	.....	1	.....	.....
	<hr/> 2965	<hr/> 395	<hr/> 672	<hr/> 212

NOTE.—Cases and deaths of the last four diseases were not reported in 1918.

VENEREAL DISEASES REPORTED BY MEDICAL OFFICERS OF HEALTH.

	<i>Cases.</i>	<i>Cases.</i>
	Nov. 1919.	Nov. 1918.
Syphilis	100	17
Gonorrhoea	171	73
Chancroid	4	4
	<hr/> 275	<hr/> 96

SMALLPOX CASES REPORTED FOR THE MONTH OF
NOVEMBER, 1919.

<i>County.</i>	<i>Municipality.</i>	<i>Cases.</i>
Algoma	Espanola	13
	Blind River	1
Brant	Brantford	3
Bruce	Teeswater	1
Elgin	Dutton	1
	Dunwich	17
Halton	Trafalgar	2
	Georgetown	1
Hastings	Hungerford	4
	Belleville	1
	Deseronto	1
Huron	Wingham	1
Kent	Chatham	2
	Harwich	4
Lambton	Walpole Island	1
Leeds and Grenville	Prescott	1
Lennox and Addington	Camden	1
Lincoln	St. Catharines	4
Middlesex	London	1
Nipissing	North Bay	4
Northd. and Durham	Darlington	4
	Brighton Township	14
	Brighton Village	1
	Murray Township	1
	Oshawa	6
Ontario	Uxbridge Town	1
	East Whitby	5
	Uxbridge Township	2
	Brock	3
Oxford	Woodstock	21
	West Oxford	1
	East Oxford	2
	East Zorra	1
	West Zorra	7
Parry Sound	Burks Falls	15
	Proudfoot	1
	Armour	1
	Parry Sound Town	1

Peel	Albion	1
	Streetsville	1
Perth	Stratford	19
	Hibbert	4
Peterboro	Peterboro	9
	Lakefield	2
Simcoe	Orillia Town	4
	Orillia Hospital	35
	Midland	2
Stormont D. & G.	Matilda	1
Sudbury	Sudbury	10
	Mattawa	6
	Martland	1
Temiskaming	Hearst	2
	Kreugerdorf	9
	Timmins	1
	Evanturel	1
Victoria	Eldon	1
	Bexley	1
Waterloo	Kitchener	1
Welland	Niagara Falls	1
	Chippawa	1
Wentworth	Hamilton	3
	Barton Township	1
York	Toronto	811
	Markham	3
	Stouffville	19
	Woodbridge	16
	Whitchurch	7
	East Gwillimbury	1
	Etobicoke Township	1
	Weston	2
		1,128

The chief incident in the monthly report of communicable diseases is the marked outbreak of smallpox which at present is found more or less epidemic in 30 counties of Ontario. The chief centre is the city of Toronto, where the disease has existed since the spring of this year, being in some cases erroneously diagnosed as chickenpox. Many of the outbreaks in the various parts of Ontario are traceable to Toronto where the report of the last few days indi-

cate that the epidemic is not yet suppressed, although some 200,000 persons, according to the report of the Medical Officer of Health have been vaccinated.

The failure of the city authorities to carry out the law in respect to compulsory vaccination and the fear of the disease spreading to the United States has led the authorities of the latter country to establish quarantine regulations at the border and to require persons travelling to the States to show evidence of recent vaccination.

This requirement has already proven to be a serious inconvenience to many travellers and a detriment to trade, and has given the city of Toronto a bad name all over the United States. Toronto will be fortunate if the neglect of its Board of Health and Council in fulfilling the vaccination law does not invite damage suits on behalf of outside points which have suffered on account of this neglect.

The disease, except in a minority of cases, is fairly mild, but its mildness is no guarantee that it may not at any moment become severe. So far this year there have been seven deaths from smallpox in Ontario.

The scientific world acknowledges the wonderful protection provided by vaccination in this disease, and it is comforting to know that the great mass of our population is quietly being vaccinated. This is particularly true of the foreign population of the city of Toronto, who doubtless have learned the value of this protection before they reached our shores. The Board has during the month of November supplied gratuitously to the public about 240,000 individual doses of smallpox vaccine. Every order up to the present has been filled and the Connaught Laboratories, the source of supply for most of our *free biological products*, has met the unprecedented demand in a manner which commands the admiration of the public.

From some quarters enquiry has been made as to why the Board has not replied to the arguments and advertisements presented in the sporadic campaign of the anti-vaccinationists. The answer is apparent. In the first place the antis have presented no argument worthy of the name, and in the second place the persons indulging in this pastime are so obviously ill-informed upon the subject that the Board considers that the public is quite able to judge fairly in the matter and that consequently the movement is unworthy of further official notice.

COMMUNICABLE DISEASES.

Communicable diseases of the commoner varieties present an enormous increase over those of the corresponding month last year. This is particularly true of scarlet fever, diphtheria, measles and whooping cough. The death rate from those affections it is gratifying to note is low, that of scarlet fever being less than 2 per cent., diphtheria 7.7 per cent., measles .5 per cent. and whooping cough 5 per cent.

PNEUMONIA.

This is the season of the year for acute primary pneumonia, from which there were 162 deaths during the month. Fortunately we have been spared the experience the country suffered from influenza last year, and it is sincerely hoped this affection may not reappear.

CORNWALL, ONT., 6th Dec., 1919.

DR. J. W. S. MCCULLOUGH,
Chief Officer of Health,
Toronto.

DEAR SIR:—

Yesterday I had a visit from Dr. Peter McLaughlin, and he gave me further details concerning the outbreak of smallpox in Winchester township, and as I thought it might be of some use as a matter of reference just now I send in the following report:

In September a young man of Winchester township developed a suspicious rash which was diagnosed by the attending physician as smallpox. This diagnosis was confirmed by Dr. McLaughlin the M. O. H. However, another firm of physicians at Chesterville, who are very well known and held in the highest repute, considered that it was a case of chickenpox, apparently owing to the mild symptoms. I was called in to decide the matter, and ordered rigid quarantine, as it was to me a clear case of smallpox. We had a great deal of difficulty in the neighborhood owing to the difference of opinion among the medical men. The balance of the family, consisting of a father, mother and young sister, absolutely refused to be vaccinated. Just before quarantine was established this young man slept at a neighboring farmhouse with another young boy of about the same age. In about ten days this second young man went

down with a virulent case of confluent smallpox. The father, mother, and one son submitted to vaccination in this family. One daughter refused. The patient died of the disease in six days. The father, mother and son escaped entirely, while the daughter who refused vaccination took the disease in a virulent form, and while she did not die she remains very badly pox-marked.

In the family of the first case the mother and daughter both contracted the disease and the mother died from it, and the daughter is very badly pox-marked. A neighboring family who had all been vaccinated took what was called chickenpox, but I am convinced they had smallpox as the first case frequently stopped at this house before he was quarantined, and the mildness of the attack was no doubt owing to the fact of their having been vaccinated.

Yours truly,

(Sgd.) P. J. MOLONEY,
District Officer of Health.

News Items

A meeting of the Board of Directors of the Canadian National Council for Combatting Venereal Diseases was held in the office of the Council, 154 Bay Street, Toronto, on December 22nd last. A large amount of routine work was disposed of. The appointment of Dr. Gordon Bates, of Toronto, as General Secretary, was confirmed. A general plan of campaign was agreed upon and a plan looking to the co-ordination of the work of the Canadian Council, the Provincial Councils and local organizations was considered and a special committee to arrange details was appointed.

Dr. O. C. J. Withrow, who for some time past has been delivering lectures on Social Hygiene in various parts of Canada and the United States, has returned to Toronto and resumed private practice.

Dr. A. K. Haywood, Medical Superintendent of the Montreal General Hospital, has been appointed chairman of a committee of the Canadian National Council for Combatting Venereal Diseases, to interest and enlighten physicians throughout Canada on the venereal disease question in Canada and the plan of the Dominion Government.

The smallpox situation in Toronto continues to attract a great deal of interest. The total number of cases reported up to December 20th was over 1,600. Compulsory general vaccination had not been ordered when this issue of the JOURNAL went to press. The first death from smallpox was reported in Toronto on December 23rd.

A very considerable increase in the number of cases of smallpox elsewhere in the Province of Ontario, is reported. Quarantine against unvaccinated persons, proceeding from Toronto has been enforced by the United States and the Provinces of Quebec and Manitoba. It is still possible for such persons to proceed in the direction of the North Pole and not be molested.

Dr. John A. Amoyt, C.M.G., Deputy Minister of Health, Department of Health, Canada, has been in Halifax in connection with the work of the Federal Department.

The library of the late Dr. F. E. Westbrook, formerly President of the University of British Columbia, comprising a great number of valuable pamphlets, reprints, bound volumes, etc., is for sale. The library is quite unique in the content of valuable material from the public health standpoint. Further information in reference to the matter may be had from Dr. R. H. Mullin, Director of Laboratories, Vancouver General Hospital, Vancouver, B.C.

Dr. Gordon Bates, General Secretary of the Canadian National Council for Combatting Venereal Diseases, visited Regina and Winnipeg during December, and delivered a number of addresses on the subject of methods of control of venereal diseases.

Correspondence

The Value of Vaccination

The following letter in reference to the smallpox situation in Toronto appeared in several Toronto papers on December 17th:

Sir,—It seems that most of the knowledge which many of Toronto's citizens possess of smallpox and vaccination against it is gleaned from the unproved and frequently untrue assertions and paid advertisements of irresponsible persons. A typical and prominent representative of this class is a gentleman who in a recent full-page anti-vaccination display euphoniously proclaims himself a "vocational adviser and character analyst." It would also seem to be not out of order for one to enquire as to just when it became desirable for the public to accept leadership in purely scientific matters from individuals who obviously have neither the qualifications of scientific training nor of scientific knowledge.

TORONTO'S POSITION.

The facts of the Toronto situation are these: Toronto is in the midst of an epidemic of smallpox which may at any time assume a very virulent character—statements of those who know nothing of the history of epidemic to the contrary notwithstanding. Many Toronto citizens have already suffered great inconvenience and the financial loss resulting from the epidemic so far has been considerable.

While smallpox is a distinct menace to the lives of Toronto citizens, the tale does not end there. The situation has become so bad that Toronto now constitutes a focus which in the absence of vigorous action may well result in the spread of the disease all over the continent. That outsiders are alarmed is amply proven by the fact that a quarantine against Toronto has been established by the United States Government and certain large cities in Canada. Aside from the public health aspect of the question, the effect which this will have on travel and trade at this time is sufficiently obvious.

WOULD STAMP OUT GERM.

This serious condition of affairs is entirely due to the fact that in Toronto a large percentage of the population is still unvaccinated,

although wholesale vaccination would stamp out the epidemic immediately. Such action has not been taken because of the misguided activities and ignorant prejudices of a small group of noisy zealots.

Under the Rockefeller Foundation there was established in the United States a few years ago a philanthropy known as the International Health Board, which has initiated and carried out most valuable work in the field of preventive medicine, particularly against malaria, yellow fever and hookworm disease. The director for the Eastern Hemisphere of this foundation is Dr. Victor G. Heiser, New York, whose standing is on a par with that of General Wm. C. Gorgas, who was responsible for the magnificent public health work carried out on the Isthmus of Panama.

UNQUESTIONABLE AUTHORITY.

In answer to an inquiry, Dr. Heiser has written as follows in regard to the efficacy of vaccination against smallpox by the use of cowpox virus:

"Your letter of December 5 in regard to my vaccination experience in the Philippines has just reached me. I do not recall just what particular stories of the Philippines I inflicted upon you, and would suggest that if you would like to have authenticated records, you write to the Surgeon-General of the Public Health Service for Bulletin No. 57, entitled 'Smallpox and Vaccination in the Philippine Islands,' by Victor G. Heiser and Oleson.

"As you may desire to have some information for immediate use, perhaps a few brief statements may be of value. There were approximately ten million vaccinations made in the Philippines without loss of life or of limb. Foreigners who were unvaccinated almost invariably contracted smallpox. I recall especially that several anti-vaccinationists who declined vaccination died of the disease within a short period after their arrival in the islands.

SAVES 30,000 LIVES.

"Six provinces near Manila which have an approximate population of one million for many years had an annual mortality from smallpox of 6,000 persons. After vaccination was completed no further deaths occurred among the vaccinated. This in a period of five years resulted in a saving of 30,000 lives.

"During the summer of 1918 some 700 deaths from smallpox have been reported in the city of Manila. In view of the fact that

Manila was thoroughly vaccinated, it might appear at first sight that this was evidence of failure of the efficacy of vaccination. On examination it was found that practically all of those deaths occurred among children who had been born since the systematic vaccination was completed, and who had not received the benefits of that operation.

"The records of the Philippines show that prior to vaccination there was an annual death rate from smallpox of approximately 40,000. Upon the completion of the ten million vaccinations referred to above this death rate was reduced to a few hundred, and these death occurred almost entirely among persons who were unvaccinated.

"The story Dr. Heiser originally told me as to the result of vaccination in the Philippines in the case of certain islands was even more remarkable than is indicated in the summary he has given above. I will endeavour to procure further information from the Surgeon-General of the United States Public Health Service as to this, and hope to forward it to you later."

TORONTO SHOULD ACT.

Meanwhile may I point out that in coming to a conclusion on such an important subject as this, one should rely only on well authenticated facts and statements by persons, such as Dr. Heiser, whose scientific reputation is absolutely above reproach and who are really able to support their assertions.

If calamitous results ensue from the Toronto epidemic, it will do us little good to bewail our fate and call down maledictions on the heads of our self-styled prophets. We should realize now that the main result of these gentlemen's activities at present is only to impede the life-saving machinery of capable health authorities and to obtain free advertisement at the expense of gullible citizens.

Meanwhile, Mr. Editor, it would seem that our city fathers are being led by the nose. Surely it is high time for Toronto to act and to act quickly.

GORDON BATES.

Editorial

Anti-Vaccination Hysteria

THE desirability or wisdom of adopting any measures calculated to reduce the incidence of preventable sickness should at all times be considered a subject suitable for reasonable discussion.

Reasonable discussion should have the merit of enlightening those whose knowledge of the subject under discussion is limited. This implies that a reasonable amount of information of a thoroughly reliable character shall be in the possession of those who engage in the controversy. And, finally, it is of course to be expected in such a discussion since it has to do with the welfare of mankind, that truth, honesty, frankness and good humour will characterize the spoken utterances or written statements of those engaging in the discussion.

The present epidemic outbreak of smallpox in Toronto has proven to be the opportunity for certain persons whose ideas of scientific discussion, are diametrically opposed in every particular to those enunciated above, to drag such a discussion into the mire.

As an example of gross, crude, unscientific and untruthful methods, the full-page paid advertisement which appeared in two evening newspapers published in Toronto on November 27th last, and in several issues of the Sunday edition of a morning newspaper, may well be regarded as the last word in hysterical outbursts. The advertisement in question was entitled "Vaccination Condemned."

In large caps the following statement was made, "The evidence accumulates, and the rush for little caskets is convincing the public that vaccination is responsible!" And this is the Twentieth Century, and the place is Toronto!

When immigrants from certain backward countries endeavour to enter a country which maintains an adequate public health service the immigrants are required to be examined by an officer of the Public Health Service in the country to which admission is desired. A Mexican endeavouring to enter the United States is so examined. Unvaccinated citizens of Toronto are at the present

time similarly dealt with. The liberty of the subject in that country is subservient to the best interests of the whole community.

It may be that some of the readers of the JOURNAL are not as fully informed as they would like to be in regard to the question of vaccination against smallpox. For such the article in the last edition (11th) of the *Encyclopaedia Britannica*, Volume 27, can be recommended; for others already somewhat informed, the Reports of the British Royal Commission on Vaccination, 1896, or the article on Smallpox and Vaccination in Rosenau "Preventive Medicine and Hygiene," will be found of value.

Book Review

"*Milk*," by Paul H. Heinman (W. B. Saunders Company, Philadelphia and London), a book of some 700 pages, is a most comprehensive survey of the subject. The opening chapter on the History of Milk is as interesting a chapter as I have ever read on this subject. For the past nine years we have had control of the milk supply of Toronto, during which time we have constantly battled for sanitary conditions on the 3,000 odd dairy farms which supply Toronto with milk. It was, therefore, something of a shock to learn that over one hundred years ago in England and Scotland there were dairies which carried out the sanitary measures which we thought very modern and up-to-date. These dairies had separate rooms for butter making, for cheese making and for washing and cleaning utensils, and the attempt was made to keep milk chilled to 50 degrees Fahrenheit.

A certain William Harvey, who kept a sanitary dairy at that time in Glasgow, recognized the importance of methods which we are doing our utmost to induce Ontario farmers to adopt at the present time. His stables were large, well aired, well lighted and clean, and the best utensils obtainable at the time were employed; dry fodder was given only after milking, and accurate records were kept of each cow to ascertain her productiveness, while manure was promptly removed from the stables and spread on the farm as fertilizer.

We would strongly urge the new U. F. O. Cabinet to advocate the measures adopted by Mr. William Harvey on the Ontario farms of to-day, and predict that if cow testing alone were systematically carried out for five years, and boarder cows replaced with real milk producers, the dairy industry would become established on a sound business-like basis which would survive irrespective of hard times. Unfortunately, in the case of Harvey, the enterprise failed during the financial depression which followed the Napoleonic war. "Milk," unfortunately then as now was "milk" to the uneducated consumer, and Harvey's whole milk could not compete with the watered product in general use.

The chapters on the Physiology of Lactation, the Physical and Chemical Characteristics of Milk, Milk Testing, Micro Organisms in Milk, Milk Enzymes, Fermented Milks, Laboratory Examination of Milk, Milk Borne Infections, the Handling and Control of Milk

Supplies, are excellent and would prove of interest both to Medical Officers of Health, Laboratory workers and Sanitarians, as well as men in the trade. The chapter on the Economic Aspect of Milk Production is worth the price of the book to any dairyman or farmer, and will bear careful study by those interested in this business. It is regrettable that the chapter on Milk and Its Relation to Infant Feeding, by Doctors Abt and Levinson, of Chicago, does not include the recent and extremely important work of MacCallum on Growth Materials, though otherwise it is quite comprehensive.

The book is extremely well illustrated and contains numerous carefully compiled tables and a very complete bibliography.

GEORGE G. NASMITH.
